AGGGAGAGTCTGCCCACAAGTTTTTGTATATTTTCTCACTGAGGCATCTATTCAGTTTGGGCAGCAGACA
CTGAGCAGAACGTAGCACGGCAATGCTTGGTAGCAATGCCTGTCCGGCCAGCACTCAGAAGACGGAGGCA
GGAGAATCATAGCTTCCAGTCAGCCTCTTCTACAATATAGTCAGTTGGAAGTCAGCCAGCTTAGACAACA
TGGAGAGCCTGTGCCGAAAGCCACTGGGTAAGCCCGAATCTCAGTAGCAGAGAGCTGCCCAGGGTGCGTA
CTGC:AAAAAAAAAACCTCAAACAACAGAAGTAGGGAGGTGTAAAATAAAGTGTAGGGGGGTGGAATTTA
AGCTGATGTGGACTTCCAAATAAAGTTACCTTTTAGATACCTATTTAAATCAATAGCATAGACCTGAAAC
TGTCTATCAGAAAATGTGTCTATTCTGAGGAAGGAGTGCTAACGAGGTTCTGTGAGGGGGGCCTCTGGCT
TTGAGAGGGTGTACCATCACATAAGACTCCTAAAAGCACATACTTTTATAAATTCACCATGAGCTTTAAC
ATCTTCTTTGTCATTTCGCAGACTGAGCCATGGAGTCTTTCGATGCTGACACCAATTCAACTGACCTACA
CTCACGGCCTCTGTTTCAACCCCAAGACATTGCCTCCATGGTCATTCTTGGTCTCACTTGTCTATTGGGA
CTGCTAGGCAATGGGCTGGTGCTGTGGGTAGCTGGCGTAAAGATGAAGACGACCGTGAACACAGTCTGGT
TCCTCCATCTCACCCTGGCCGATTTCCTCTGCTGCCTCTCCTTGCCCTTCTCCTTGGCTCACCTGATTCT
CCAAGGACACTGGCCCTATGGCTTGTTCCTGTGCAAACTTATCCCATCCATCATTATTCTCAACATGTTT
GCCAGTGTCTTCCTGCTTACTGCCATTAGCCTGGACCGATGTCTGATAGTACATAAGCCAATCTGGTGCC
AGAATCATCGAAACGTGAGAACCGCCTTCGCCATCTGTGGATGTGTCTGGGTGGTAGCCTTTGTGATGTG
TGTGCCCGTATTTGTATACCGTGATCTGTTCATTATGGACAATCGCAGTATATGTAGATATAATTTTGAT
TCCTCCAGGTCATATGATTATTGGGACTACGTGTACAAACTAAGTCTACCAGAAAGCAATTCTACTGATA
ACTCCACTGCTCAGCTAACTGGACATATGAATGACAGGTCAGCTCCTTCCTCTGTACAGGCAAGGGATTA
CTTTTGGACAGTTACCACTGCCCTCCAGTCACAGCCATTCCTAACATCTCCTGAAGACTCATTCTCTCTA
GATTCAGCAAACCAACAACCCCATTATGGTGGAAAGCCTCCTAATGTCCTCACAGCCGCCGTACCCAGCG
GGTTTCCTGTTGAAGATCGTAAATCCAATACACTGAACGCTGACGCTTTTCTCTCTGCTCACACAGAACT
TTTCCCTACTGCTTCTAGTGGTCATTTATACCCCTATGATTTCCAGGGGGATTATGTTGACCAATTCACG
TATGACAATCATGTGCCGACACCGCTGATGGCAATAACCATCACAAGGCTGGTGGTGGGCTTCCTGGTGC
CGTTTTTCATCATGGTAATTTGTTACAGCCTCATCGTCTTCAGAATGCGAAAAACCAACTTCACCAAGTC
TCGGAACAAAACCTTTCGGGTGGCTGTGGCTGTGGTCACTGTCTTTTTTATCTGCTGGACTCCATACCAT
CTTGTCGGAGTCCTGCTATTGATTACTGATCCAGAAAGTTCCTTGGGGGAAGCTGTGATGTCCTGGGACC
ACATGTCCATTGCTTTAGCATCTGCCAATAGTTGCTTCAACCCTTTCCTGTATGCCCTCTTGGGGAAAGA
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TCTACCAACTGTACCCAAGACAAAGCCTCTTCAAAAAGAAACAATATGAGTACAGATGTGTGAAGATGTG
GCCCTGGGAACCTAAGCAGAGTTCTCAGGTGAACAGTGATGGATGACATGTGAGCAGGACACTTTAGACA
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TTCAAGCCCCATCCCAGATGTGTTGACTCAGAATCTCTGGCCCATGGGACCAGTGTTTTAACAGGCCTTC
TTGTTTCCATCAGTGTTAAGTTTTACCTCATTTGGCTTAGTCTATTCCCATCCCTGACTACACCATGTGC
AATGAATAACTTTTTCATCTGTTTTCAGTATTCTTTTTTTTTCCTTAGCATCATCTAAACTTCTAGTTTG
CATGGAAGGCTGCTCTTATTGTTCTGAATGGAAGATATTCATTTATTGTACAGTTTTGTGGTGGTGACAA
GTGATTTTTAAGTGGGGAAAGAGACACAGTAAGAAAAGATCTATGAAAGCAGGGAGTGTTGAGTTAGAGT
TTGACAGAACACAGTGCCAAATGCCACCCACTAAAAGCAACCTGAGATAATTCCAGTGTTCATGTGAGCA
AGTGAGCACAGATACACATAAACACTTTCCTACTCCTGGAGTGTTTTAGAAGTTGTAGCTTGGAGCTC
(SEQ ID NO:1)

MESFDADTNSTDLHSRPLFQPQDIASMVILGLTCLLGLLGNGLVLWVAGVKMKTTVNTVWFLHLT
LADFLCCLSLPFSLAHLILQGHWPYGLFLCKLIPSIIILNMFASVFLLTAISLDRCLIVHKPIWCQNHR
NVRTAFAICGCVWVVAFVMCVPVFVYRDLFIMDNRSICRYNFDSSRSYDYWDYVYKLSLPESNS
TDNSTAQLTGHMNDRSAPSSVQARDYFWTVTTALQSQPFLTSPEDSFSLDSANQQPHYGGKPP
NVLTAAVPSGFPVEDRKSNTLNADAFLSAHTELFPTASSGHLYPYDFQGDYVDQFTYDNHVPTP
LMAITITRLVVGFLVPFFIMVICYSLIVFRMRKTNFTKSRNKTFRVAVAVVTVFFICWTPYHLVGVLL
LITDPESSLGEAVMSWDHMSIALASANSCFNPFLYALLGKDFRKKARQSIKGILEAAFSEELTHST
NCTQDKASSKRNNMSTDV (SEQ ID NO:2)

FIG. 1

underlined = deleted in targeting construct

[ ] = sequence flanking Neo insert in targeting construct

AGGGAGAGTCTGCCCACAAGTTTTTGTATATTTTCTCACTGAGGCATCTATTCAGTTTGG
GCAGCAGACACTGAGCAGAACGTAGCACGGCAATGCTTGGTAGCAATGCCTGTCCGGCCA
GCACTCAGAAGACGGAGGCAGGAGAATCATAGCTTCCAGTCAGCCTCTTCTACAATATAG
TCAGTTGGAAGTCAGCCAGCTTAGACAACATGGAGAGCCTGT[GCCGAAAGCCACTGGGTA
AGCCCGAATCTCAGTAGCAGAGAGCTGCCCAGGGTGCGTACTGC:AAAAAAAAAACCTCA
AACAACAGAAGTAGGGAGGTGTAAAATAAAGTGTAGGGGGGTGGAATTTAAGCTGATGTG
GACTTCCAAATAAAGTTACCTTTTAGATACCTATTTAAATCAATAGCATAGACCTGAAAC
TGTCTATCAGAAAATGTGTCTATTCTGAGGAAGGAGTGCTAACGAGGTTCTGTGAGGGGG
GCCTCTGGCTTTGAGAGGGTGTACCATCACATAAGACTCCTAAAAGCACATACTTTTATA
AATTCACCATGAGCTTTAACATCTTCTTTGTCATTTCGCAGACTGAGCCATGGAGTCTTT
CGATGCTGACACCAATTCAACTGACCTACACTCACGGCCTCTGTTTCAACCCCAAGACAT
TG]CCTCCATGGTCATTCTTGGTCTCACTTGTCTATTGGGACTGCTAGGCAATGGGCTGGT
GCTGTGGGTAGCTGGCGTAAAGATGAAGACGACCGTGAACACAGTCTGGTTCCTCCATCT
CACCCTGGCCGATTTCCTCTGCTGCCTCTCCTTGCCCTTCTCCTTGGCTCACCTGATTCT
CCAAGGACACTGGCCCTAT[GGCTTGTTCCTGTGCAAACTTATCCCATCCATCATTATTCT
CAACATGTTTGCCAGTGTCTTCCTGCTTACTGCCATTAGCCTGGACCGATGTCTGATAGT
ACATAAGCCAATCTGGTGCCAGAATCATCGAAACGTGAGAACCGCCTTCGCCATCTGTGG
ATGTGTCTGGGTGGTAGCCTTTGTGATGTGTGTGCCCGTATTTGTATACCGTGATCTGTT
CATTATGGACAATCGCAGTATATGTAGATATAATTTTGATTCCTCCAGGTCATATGATTA
TTGGGACTACGTGT]ACAAACTAAGTCTACCAGAAAGCAATTCTACTGATAACTCCACTGC
TCAGCTAACTGGACATATGAATGACAGGTCAGCTCCTTCCTCTGTACAGGCAAGGGATTA
CTTTTGGACAGTTACCACTGCCCTCCAGTCACAGCCATTCCTAACATCTCCTGAAGACTC
ATTCTCTCTAGATTCAGCAAACCAACAACCCCATTATGGTGGAAAGCCTCCTAATGTCCT
CACAGCCGCCGTACCCAGCGGGTTTCCTGTTGAAGATCGTAAATCCAATACACTGAACGC
TGACGCTTTTCTCTCTGCTCACACAGAACTTTTCCCTACTGCTTCTAGTGGTCATTTATA
CCCCTATGATTTCCAGGGGGATTATGTTGACCAATTCACGTATGACAATCATGTGCCGAC
ACCGCTGATGGCAATAACCATCACAAGGCTGGTGGTGGGCTTCCTGGTGCCGTTTTTCAT
CATGGTAATTTGTTACAGCCTCATCGTCTTCAGAATGCGAAAAACCAACTTCACCAAGTC
TCGGAACAAAACCTTTCGGGTGGCTGTGGCTGTGGTCACTGTCTTTTTTATCTGCTGGAC
TCCATACCATCTTGTCGGAGTCCTGCTATTGATTACTGATCCAGAAAGTTCCTTGGGGGA
AGCTGTGATGTCCTGGGACCACATGTCCATTGCTTTAGCATCTGCCAATAGTTGCTTCAA
CCCTTTCCTGTATGCCCTCTTGGGGAAAGACTTTAGGAAGAAAGCAAGACAGTCTATAAA
GGGCATTCTGGAAGCAGCCTTCAGCGAAGAGCTCACGCACTCTACCAACTGTACCCAAGA
CAAAGCCTCTTCAAAAAGAAACAATATGAGTACAGATGTGTGAAGATGTGGCCCTGGGAA
CCTAAGCAGAGTTCTCAGGTGAACAGTGATGGATGACATGTGAGCAGGACACTTTAGACA
ATTTGGCGACTCTCAGAGAAAGGTCTCTTATTGACATCAGCATCATTTGAAAACATTAAA
GATGCAAAATTTCAAGCCCCATCCCAGATGTGTTGACTCAGAATCTCTGGCCCATGGGAC
CAGTGTTTTAACAGGCCTTCTTGTTTCCATCAGTGTTAAGTTTTACCTCATTTGGCTTAG
TCTATTCCCATCCCTGACTACACCATGTGCAATGAATAACTTTTTCATCTGTTTTCAGTA
TTCTTTTTTTTTCCTTAGCATCATCTAAACTTCTAGTTTGCATGGAAGGCTGCTCTTATT
GTTCTGAATGGAAGATATTCATTTATTGTACAGTTTTGTGGTGGTGACAAGTGATTTTTA
AGTGGGGAAAGAGACACAGTAAGAAAAGATCTATGAAAGCAGGGAGTGTTGAGTTAGAGT
TTGACAGAACACAGTGCCAAATGCCACCCACTAAAAGCAACCTGAGATAATTCCAGTGTT
CATGTGAGCAAGTGAGCACAGATACACATAAACACTTTCCTACTCCTGGAGTGTTTTAGA
AGTTGTAGCTTGGAGCTC

FIG. 2A

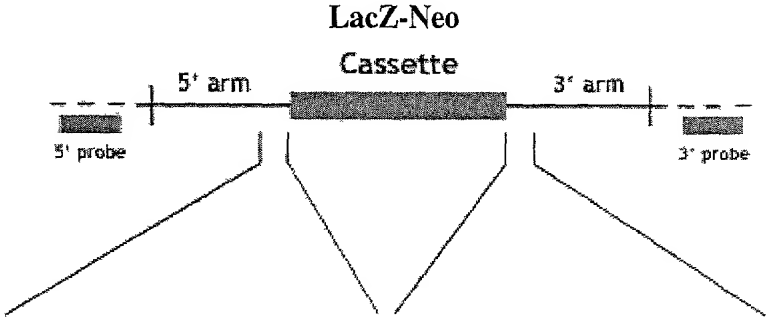
Gene Sequence Structure *

663 bp | Sequence Deleted | 859 bp

Size of full-length cDNA: 2658 bp

Targeting Vector* (genomic sequence)

Construct Number: 3036



Arm Length:
5': 3.2 kb
3': 1.8 kb

Targeting Vector	
Endogenous Locus	

* Not drawn to scale

5'>CGAGGTTCTGTGAGGGGGGCC TCTGGCTTTGAGAGGGTGTACCAT CACATAAGACTCCTAAAAGCACAT ACTTTTATAAATTCACCATGAGCT TTAACATCTTCTTTGTCATTTCGC AGACTGAGCCATGGAGTCTTTCGA TGCTGACACCAATTCAACTGACCT ACACTCACGGCCTCTGTTTCAACC CCAAGACATTG<3'(SEQ ID NO:3)	5'>GGCTTGTTCCTGTGCAAACTT ATCCCATCCATCATTATTCTCAAC ATGTTTGCCAGTGTCTTCCTGCTT ACTGCCATTAGCCTGGACCGATGT CTGATAGTACATAAGCCAATCTGG TGCCAGAATCATCGAAACGTGAGA ACCGCCTTCGCCATCTGTGGATGT GTCTGGGTGGTAGCCTTTGTGATG TGTGTGCCCGT<3'(SEQ ID NO:4)

FIG. 2B

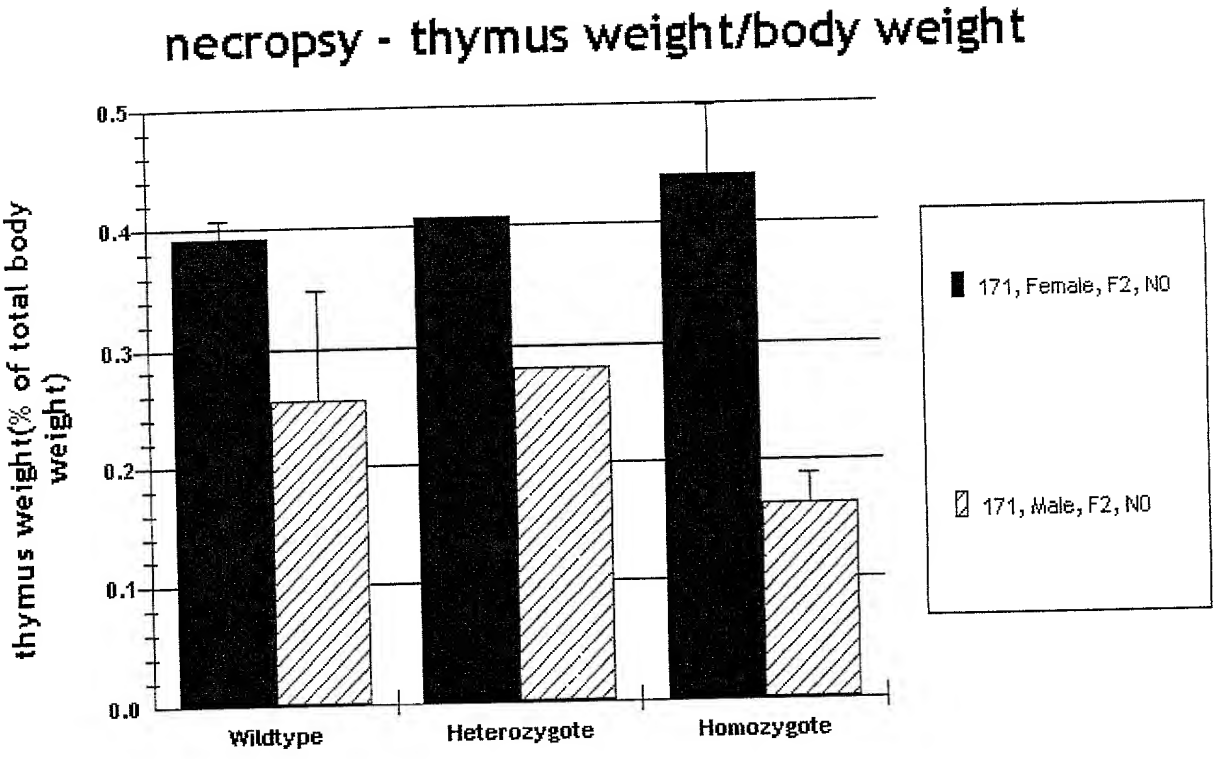


Fig. 3